

- NATURAL CAUSES OF PROFILE CHANGE

VOLCANO (strat., tropo., sf)
SOLAR?

- HUMAN-RELATED CAUSES OF PROFILE CHANGE
- NOW AND FUTURE

INTRODUCTION

How do we know? OBS, MODELS
Earth - integrate all effects & feedbacks
HUMAN AGENTS - REDISTRIBUTE HEAT ENERGY
FEEDBACKS e.g. precip effect, ice albedo

WELL-MIXED GHGs

OZONE CHANGES

LAND ALTERATIONS

AEROSOLS

CUMULATIVE EFFECT

2. How do the temperature trends and changes vary at different levels in the atmosphere and why?

- What causes the average temperature profile?

Define surface, troposphere, stratosphere. Fig - $T(z)$

Sun is source of energy

Profile responds to sfc heating, ozone heating, some atmos
Redistribution by

MOIST CONVECTION

IR REDISTRIBUTION - GHG

DYNAMICAL REDISTRIBUTION - REGION and layer

- Regional Variations of avg. profile

ITCZ

Marine inversions

Tropopause height

Fig 3, 4

- TEMPORAL VARIATIONS

DAILY (DIURNAL)

SEASONAL

JRC

The Vertical Temperature Profile is the combined effect of many different processes responding to solar heating

